


<b>Form 1449*</b> <b>INFORMATION DISCLOSURE STATEMENT</b> <b>IN AN APPLICATION</b> (Use several sheets if necessary)		Docket Number: 1008-015US01		Application Number: 10/796,567		
		Applicant: Georgios B. Giannakis; Liqing Yang				
		Filing Date: March 8, 2004		Group Art Unit: 2631		
		Examiner Name: Unknown				
<b>U.S. PATENT DOCUMENTS</b>						
Examiner Initial	Document Number	Issue/Document Publication Date	Name		Filing Date If Appropriate	
<b>FOREIGN PATENT DOCUMENTS</b>						
Examiner Initial	Document Number	Publication Date	Country	Translation		
				Yes	No	
<b>OTHER DOCUMENTS (Including Authors, Title of Item, Page(s), Vol/Issue No., Publisher, Place of Publication)</b>						
/JATM/	Z. Wang et al., "Block Precoding for MUI/ISI-Resilient Generalized Multicarrier CDMA with Multirate Capabilities," IEEE Transactions on Communications, Vol. 49, no. 11, pp. 2016-2027, November 2001.					1
	F. Ramirez-Mireles et al., "System Performance Analysis of Impulse Radio Modulation," Proceedings Radio Wireless Conference, Colorado Springs, CO, pp. 67-70, August 1998.					2
	M. Win et al., "Ultra-Wide Bandwidth Time-Hopping Spread-Spectrum Impulse Radio for Wireless Multiple-Access Communications," IEEE Transactions on Communications, Vol. 48, No. 4, pp. 679-691, April 2000.					3
	A. Saleh et al., "A Statistical Model for Indoor Multipath Propagation," IEEE Journal on Selected Areas in Communications, Vol. SAC-5, No. 2, pp. 128-137, February, 1987.					4
	B. Hassibi et al., "On the Expected Complexity of Sphere Decoding," Proceedings of the Asilomar Conference on Signals, Systems and Computers, Vol. 2, pp. 1051-1055, 2001.					5
	B. Hochwald et al., "Unitary Space-Time Modulation for Multiple-Antenna Communications in Rayleigh Flat Fading," IEEE Transactions on Information Theory, Vol. 46, No. 2, pp. 543-564, March 2000.					6
	C. Le Martret et al., "All-Digital PPM Impulse Radio for Multiple-Access Through Frequency-Selective Multipath," Procedures of GLOBECOM, Vol. 1, pp. 22-26, San Francisco, CA, November 17 - December 1, 2000.					7
	C.J. Le Martret et al., "All-Digital Impulse Radio with Multiuser Detection for Wireless Cellular Systems," IEEE Transactions on Communications, Vol. 50, No. 9, pp. 1440-1450, September 2002.					8

/JATM/	C.J. Le Martret et al., "All-Digital PAM Impulse Radio for Multiple-Access Through Frequency-Selective Multipath," Procedure of Sensor Array and Multichannel Signal Processing Workshop, Boston, pp. 77-81, March 2000.	9
	D. Cassioli et al., "Performance of Low-Complexity Rake Reception in a Realistic UWB Channel," 2002 IEEE International Conference on Communications, pp. 763-767, New York City, N.Y., April 28 – May 2, 2002.	10
	E. Homier et al., "Rapid Acquisition of Ultra-Wideband Signals in the Dense Multipath Channel," G.E Research Development Center, Technical Information Series, pp. 105-109, January, 2002.	11
	F. Gini et al., "Frequency Offset and Symbol Timing Recovery in Flat-Fading Channels: A Cyclostationary Approach," IEEE Transactions On Communications, Vol. 46, No. 3, pp. 400-411, March 1998.	12
	F. Ramirez-Mireles et al., "Multiple Access With Time-Hopping and Block Waveform PPM Modulation," 1998 IEEE International Conference on Communciations, Vol. 2 of 3, pp. 775-779, Atlanta, Georgia, June 1998.	13
	G. Leus et al., "MUI-Free Receiver for a Synchronous DS-CDMA System Based on Block Spreading in the Presence of Frequency-Selective Fading," IEEE Transactions on Signal Processing, Vol. 48, No. 11, pp. 3175-3188, November 2000.	14
	G.B. Giannakis et al., "AMOUR-Generalized Multicarrier Transceivers for Blind CDMA Regardless of Multipath," IEEE Transactions on Communciations, Vol. 48, No. 12, pp. 2064-2076, December 2000.	15
	H. Lee et al., "Multipath Characteristics of Impulse Radio Channels," 2000 IEEE 51 <sup>st</sup> Vehicular Technology Conference Proceedings, Tokyo, Japan, pp. 2487-2491, May 15-18, 2000.	16
	J.D. Choi et al., "Performance of Autocorrelation Receivers for Ultra-Wideband Communications with PPM in Multipath Channels," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 213-217, Baltimore, MD, USA, May 2002.	17
	J.D. Choi et al., "Performance of Ultra-Wideband Communications With Suboptimal Receivers in Mulipath Channels," IEEE Journal on Selected Areas in Communciations, Vol. 20, No. 9, pp. 1754-1766, December 2002.	18
	J.K. Cavers, "An Analysis of Pilot Symbol Assisted Modulation for Rayleigh Fading Channels," IEEE Transactions On Vehicular Technology, Vol. 40, No. 4, pp. 686-693, November 1991.	19
 /JATM/	J.R. Foerster, "The Effects of Multipath Interference on the Performance of UWB Systems in and Indoor Wireless Channel," IEEE VTS 53 <sup>rd</sup> Vehicular Technology Conference, Vol. 2, pp. 1176-1180, Rhodes, Greece, May 6-9, 2001.	20

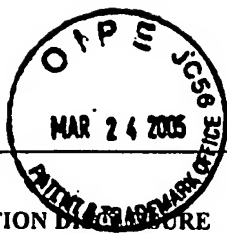
/JATM/	J.R. Foerster et al., "Ultra-Wideband Technology for Short- or Medium-Range Wireless Communications," Ultra-Wideband Technology for Short- or Medium-Range Wireless Communications, pp. 1-11. April 2001	21
	K.Siwiak et al., "Ultra-Wide Band Radio: The Emergence of An Important New Technology," IEEE VTS 53 <sup>rd</sup> Vehicular Technology Conference, Vol. 2, pp. 1169-1172, Rhodes, Greece, May 6-9, 2001.	22
	L. Yang et al., "Multistage Block-Spreading for Impulse Radio Multiple Access Through ISI Channels," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1767-1777, December 2002.	23
	L. Yang et al., "Space-Time Coding for Impulse Radio," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 235-239, Baltimore, MN, May 20-23, 2002.	24
	L. Yang et al., "Impulse Radio Multiple Access Through ISI Channels With Multi-Stage Block-Spreading" 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 277-281, Baltimore, MD, May 21-23, 2002.	25
	L. Yang et al., "Optimal Pilot Waveform Assisted Modulation for Ultrawideband Communications," IEEE Transactions on Wireless Communications, Vol. 3, No. 4, pp. 1236-1349, July 2004.	26
	L. Yang et al., "Non-Data Aided Timing Acquisition of Ultra-Wideband Transmissions Using Cyclostationarity," 2003 IEEE International Conference on Acoustics, Speech and Signal Processing, Hong Kong, Vol. IV of VI, April 6-10, 2003.	27
	M.Z. Win et al., "Impulse Radio: How it Works," IEEE Communications Letters, Vol. 2, No. 2, pp. 36-38, February 1998.	28
	M.L. Welborn, "System Considerations for Ultra-Wideband Wireless Networks," 2001 IEEE Radio and Wireless Conference, pp. 5-8, Boston, MA, August 19-22, 2001.	29
	M.Z. Win et al., "On the Energy Capture of Ultrawide Bandwidth Signals in Dense Multipath Environments," IEEE Communications Letters, Vol. 2, No. 9, pp. 245-247, September 1998.	30
	<del>M.Z. Win et al., "Ultra-Wide Bandwidth Time-Hopping Spread-Spectrum Impulse Radio for Wireless Multiple Access Communications," IEEE Transactions on Communications, Vol. 48, No. 4, pp. 679-691, April 2000.</del>	31
	M.Z. Win et al., "Virtual Path Analysis of Selective Rake Receiver in Dense Multipath Channels," IEEE Communications Letters, Vol. 3, No. 11, pp. 308-310, November 1999.	32
↓ /JATM/	M.Z. Win et al., "ATM-Based TH-SSMA Network for Multimedia PCS," IEEE Journal on Selected Areas in Communications, Vol. 17, No. 5, pp. 824-836, May 1999.	33

/JATM/	O. Wintzell et al., "On the Capacity of a Pulse-Position-Hopped CDMA System," IEEE Transactions On Information Theory, Vol. 47, No. 6, pp. 2639-2644, September 2001.	34
	P. Withington, II et al., "An Impulse Radio Communications System," Ultra-Wideband, Short-Pulse Electromagnetics, Brooklyn, NY, pp. 113-12, October 1992.	35
	R. Fleming et al., "Rapid Acquisition for Ultra-Wideband Localizers," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, Balimore, MD, pp. 245-249, May 21-21, 2002.	36
	R.A. Scholtz, "Multiple Access with Time-Hopping Impulse Modulation," Communications On The Move, Boston, MA, USA, pp. 447-450, October 1993.	37
	R.T. Hootor et al., "An Overview of Delay-Hopped, Transmitted-Reference RF Communications," GE Research and Development Center, Technical Information Series, pp. 1-29, January 2002.	38
	S. Adireddy et al., "Optimal Placement of Training for Frequency-Selective Block-Fading Channels," IEEE Transactions On Information Theory, Vol. 48, No. 8, pp. 2338-2353, August 2002.	39
	S. Ohno et al., "Optimal Training and Redundant Precoding for Block Transmissions with Application to Wireless OFDM," IEEE Transactions on Communications, Vol. 50, No. 12, December 2002.	40
	S. Zhou et al., "Space-Time Coding with Maximum Diversity Gains Over Frequency-Selective Fading Channels," IEEE Signal Processing Letters, Vol. 8, No. 10, pp. 269-272, October 2001.	41
	S. Zhou et al., "Chip-Interleaved Block-Spread Code Division Multiple Access," IEEE Transactions on Communications, Vol. 50, No. 2, pp. 235-248, February 2002.	42
	S.M. Alamouti, "A Simple Transmit Diversity Technique for Wireless Communications," IEEE Journal On Selected Areas In Communications, Vol. 16, No. 8, pp. 1451-1458, October 2000: 1998	43
	S.S. Kolenchery et al., "A Novel Impulse Radio Network for Tactical Wireless Communications," Procedures Milcom Conference, Bedford, MA, October 1998.	44
	S.S. Kolenchery et al., "Performance of Local Power Control in Peer-to-Peer Impulse Radio Networks With Bursty Traffic," IEEE Global Telecommunications Conference, Vol 2 of 3, Phoenix, AZ, USA, pp. 910-916, November 3-8, 1997.	45
↓ /JATM/	U. Fincke et al., "Improved Methods For Calculating Vectors of Short Length in a Lattice, Including a Complexity Analysis," Mathematics of Computation, Vol. 44, No. 170, pp. 463-471, April 1985.	46

/JATM/	V. Lottici et al., "Channel Estimation for Ultra-Wideband Communications," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1638-1645, December 2002.	47
	V. Tarokh et al., "Space-Time Block Codes From Orthogonal Designs," IEEE Transactions on Information Theory, Vol. 45, No. 5, pp. 1456-1467, July 1999.	48
	V. Tarokh et al., "Space-Time Codes for High Data Rate Wireless Communication: Performance Criterion and Code Construction," IEEE Transactions on Information Theory, Vol. 44, No. 2, pp. 744-765, March 1998.	49
	W.M. Lovelace et al., "The Effects of Timing Jitter on the Performance of Impulse Radio," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, pp. 251-254, Baltimore, MD, May 21-23, 2002.	50
	X. Chen et al., "Monocycle Shapes for Ultra Wideband System," 2002 IEEE International Symposium on Circuits and Systems, Vol. I of V, pp. I-597 - I-600, Scottsdale, AZ, May 25-29, 2002.	51
	Z. Tian et al., "Symbol Timing Estimation in Ultra-Wideband Communications," Proceedings of 36 <sup>th</sup> Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 3-6, 2002.	52
	Z. Wang et al., "Wireless Multicarrier Communications: Where Fourier Meets Shannon," IEEE Signal Processing Magazine, Vol. 47, No. 3, pp. 1-21, May, 2000.	53
↓ /JATM/	Z. Wang et al., "Vandermonde-Lagrange Mutually Orthogonal Flexible Transceivers for Blind CDMA in Unknown Multipath," Procedures of Workshop on Signal Processing Advances in Wireless Communication, Annapolis, MD, pp. 42-45, May 9-12, 1999.	54
<b>EXAMINER</b>  /Juan Torres/		<b>Date Considered</b>  04/25/2007
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		


Based on Form PTO-FB-A820  
(Also form PTO-1449)

Patent and Trademark Office, U.S. Department of Commerce



Form 1449*		Docket Number: 1008-015US01		Application Number: 10/796,567	
<b>INFORMATION DISCLOSURE STATEMENT</b>  <b>IN AN APPLICATION</b>  (Use several sheets if necessary)		Applicant: Georgios B. Giannakis; Liuqing Yang			
		Filing Date: March 8, 2004		Group Art Unit: 2631	
		Examiner Name: Unknown			
<b>U.S. PATENT DOCUMENTS</b>					
Examiner Initial	Document Number	Issue/Document Publication Date	Name		Filing Date If Appropriate
<b>FOREIGN PATENT DOCUMENTS</b>					
Examiner Initial	Document Number	Publication Date	Country	Translation	
				Yes	No
<b>OTHER DOCUMENTS (Including Authors, Title of Item, Page(s), Vol/Issue No., Publisher, Place of Publication)</b>					
/JATM/	B. Parr et al., "A Novel Ultra-Wideband Pulse Design Algorithm," IEEE Communications Letter, Vol. 7, No. 5, pp. 219-221, May 2003.				55
	J. Romme et al., "On the Power Spectral Density of Time-Hopping Impulse Radio," 2002 IEEE Conference on Ultra-Wideband Systems and Technologies, Wyndham Baltimore Inner Harbor, pp. 241-244, May 2002.				56
	M.Z. Win, "Spectral Density of Random UWB Signals," IEEE Communications Letters, Vol. 6, No. 12, pp. 526-528, December 2002.				57
	J. Han et al., "A New Ultra-Wideband, Ultra-Short Monocycle Pulse Generator with Reduced Ringing," IEEE Microwave and Wireless Components Letters, Vol. 12, No. 6, pp. 206-208, June 2002.				58
	J.S. Lee et al., "New Uniplanar Subnanosecond Monocycle Pulse Generator and Transformer for Time-Domain Microwave Applications," IEEE Transactions on Microwave Theory and Techniques, Vol. 49, No. 6, pp. 1126-1129, June 2001.				59
	T.W. Parks et al., "Chebyshev Approximation for Nonrecursive Digital Filters with Linear Phase," IEEE Transactions on Circuit Theory, Vol CT-19, No. 2, pp. 189-194, March 1972.				60
↓ /JATM/	D. Kelly et al., "PulsON Second Generation Timing Chip: Enabling UWB Through Precise Timing," 2002 IEEE Conference on Ultra-Wideband Systems and Technologies, Wyndham Baltimore Inner Harbor, pp. 117-121, May 2002.				61

/JATM/	X. Luo et al., "Designing Optimal Pulse-Shapers for Ultra-Wideband Radios," Journal of Communications and Networks, Vol. 5, No. 4, pp. 344-353, December 2003.	62
	J.R. Foerster, "The Performance of a Direct-Sequence Spread Ultra-Wideband System in the Presence of Multipath, Narrowband Interference, and Multiuser Interference," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, Wyndham Baltimore Inner Harbor, pp. 87-92, May 2002.	63
	B.M. Sadler et al., "On the Performance of UWB and DS-Spread Spectrum Communication Systems," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, Wyndham Baltimore Inner Harbor, pp. 289-292, May 2002.	64
	R.A. Scholtz, "Multiple Access with Time-Hopping Impulse Modulation," Communications on the Move, Conference Record Vol. 2 of 3, MILCOM Conference, Boston, MA, pp. 447-450, 1993.	65
	L. Yang et al., "Multistage Block-Spreading for Impulse Radio Multiple Access Through ISI Channels," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1767-1777, December 2002.	66
	Z. Wang, "Multi-Carrier Ultra-Wideband Multiple-Access with Good Resilience Against Multiuser Interference," 2003 Conference on Information Sciences & Systems, The John Hopkins University, Baltimore, MD, pp. 1-5, March 2003.	67
	D. Cassioli, et al., "Performance of Low-Complexity Rake Reception in a Realistic UWB Channel," 2002 IEEE International Conference on Communications, New York, NY, pp. 763-767, April 28-May 2, 2002.	68
	Z. Wang et al., "A Simple and General Parameterization Quantifying Performance in Fading Channels," IEEE Transactions on Communications, Vol. 51, No. 8, pp. 1389-1398, August 2003.	69
	L. Yang et al., "Analog Space-Time Coding for Multiantenna Ultra-Wideband Transmissions," IEEE Transactions on Communications, Vol. 52, No. 3, pp. 507-517, March 2004.	70
	I. Bergel et al., "Narrow-Band Interference Suppression in Time-Hopping Impulse-Radio Systems," 2002 IEEE Conference on Ultra Wideband Systems and Technologies, Wyndham Baltimore Inner Harbor, pp. 303-307, May 2002.	71
	L. Yang et al., "Unification of Ultra-Wideband Multiple Access Schemes and Comparison in the Presence of Interference," The Thirty-Seventh Asilomar Conference on Signals, Systems & Computers, Pacific Grove, CA, pp. 1239-1243, November 2003.	72
↓ /JATM/	G. Durisi, et al., "Performance of TH and DS UWB Multiaccess Systems in Presence of Multipath Channel and Narrowband Interference," Procedure of International Workshop on Ultra Wideband Systems, Oulu, Finland, 5 pages, June 2003.	73

/JATM/	Z. Wang et al., "Complex-Field Coding for OFDM Over Fading Wireless Channels," IEEE Transactions on Information Theory, Vol. 49, No. 3, pp. 707-720, March 2003.	74
	A.V. Oppenheim, et al., <i>Discrete-Time Signal Processing</i> , 2 <sup>nd</sup> Edition, Prentice Hall, Chapter 7, "Optimum Approximations of Fir Filters," pgs. 486-511, 1999.	75
	FCC Report and Order, <i>In the Matter of Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems</i> , FCC 02-48, pp. 7434-7553, April 2002.	76
	IEEE P802.15 Working Group for WPAN, <i>Channel Modeling Sub-Committee Report Final</i> , IEEE 802.15-02/368r5-SG3a, pp. 1-40, November 2002.	77
	L. Yang et al., "Digital-Carrier Multi-Band User Codes for Baseband UWB Multiple Access," Journal of Communications and Networks, Vol. 5, No. 4, pp. 374-385, December 2003.	78
	M. Hamalainen et al., "On the UWB System Coexistence With GSM900, UMTS/WCDMA, and GPS," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1712-1721, December 2002.	79
	L. Zhao et al., "Performance of Ultra-Wideband Communications in the Presence of Interference," IEEE Journal on Selected Areas in Communications, Vol. 20, No. 9, pp. 1684-1691, December 2002.	80
	S. Zhou et al., "Digital Multi-Carrier Spread Spectrum Versus Direct Sequence Spread Spectrum for Resistance to Jamming and Multipath," IEEE Transactions on Communications, Vol. 50, No. 4, pp. 643-655, April 2002.	81
	<del>P. Withington, "Impulse Radio Overview," Time Domain Corp., pp. 1-7, downloadable from <a href="http://user.it.uu.se/carl/Notes/UWB.pdf">http://user.it.uu.se/carl/Notes/UWB.pdf</a>.</del>	82
<b>EXAMINER</b>  /Juan Torres/		<b>Date Considered</b>  04/25/2007
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Based on Form PTO-FB-A820 Patent and Trademark Office, U.S. Department of Commerce (Also form PTO-1449)		